



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference BP110732		FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/FI2005/000004	International filing date (day/month/year) 04.01.2005	Priority date (day/month/year) 05.01.2004	
International Patent Classification (IPC) or national classification and IPC C13K1/06, C08B30/12			
Applicant KEMIRA OYJ et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>			
Date of submission of the demand 28.10.2005		Date of completion of this report 20.01.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Lensen, H Telephone No: +31 70 340-2428 	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No. PCT/JP2005/000004
 AP20 Recd FEB 20 JUN 2006

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements* of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-13 as originally filed

Claims, Numbers

1-14 as originally filed

Drawings, Sheets

1/1 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/FI2005/000004

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-14
	No: Claims	
Inventive step (IS)	Yes: Claims	6, 9-11
	No: Claims	1-5, 7-8, 12-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/FI2005/000004

AP20 Rec'd PCT/PTO 30 JUN 2006

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1). Reference is made to the following documents:

D1 : JP-A-01225601

& PAJ Volume 13, no. 549 (C-662)

D2 : US-B1-6250721

D3 : Journal of the American Chemical Society, 2002, Volume 124, pages 4974-4975

2). Art. 33(2) PCT :

The present application meets the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is new in the sense of Article 33(2) PCT.

No document of the available prior art discloses unambiguously the depolymerization of starch, dissolved in an ionic liquid.

3) Art. 33(3) PCT :

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses a depolymerization process of starch by microwave heating in the absence of an acid or a base catalyst and without an enzyme.

The subject-matter of claim 1 therefore differs from this known process in that the starch is dissolved in an ionic liquid solvent.

The problem to be solved by the present invention may therefore be regarded as to provide a new process for the selective and quantitative depolymerization of starch.

The technical features of temperature and time are not specified and are in claim 4 and 5 generally known features in the technical field of preparing glucose by hydrolysis of starch. The method is also directed to the quantitative depolymerization of starch into sugars only.

The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

D2 gives a clear suggestion that starch is degraded in an ionic liquid (see column 5, lines 14-16 and line 35. The skilled person would easily consider the degradation as a form of

depolymerization.

D3 discloses the dissolution and decomposition of cellulose with ionic liquids.

The hydrolysis of cellulose is for the skilled person a neighbouring technical field which he can consult easily for solving the problem posed. Cellulose is indicated as a biorenewable material and starch is also known as being biorenewable. In D3 the assistance of microwave heating is also emphasised as being beneficial.

The skilled person would easily find an incentive in D2 and/or D3 to adapt the teaching of D1 and come to something which falls within the terms of the claims of the present invention.

4). Dependent claims 2-5, 7-8, 12-14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, see documents D1-D3 and the corresponding passages cited in the search report.

5). The subject-matter of claim 6 and 9-11 involves an inventive step for the following reasons.

The skilled person has no hint from the available prior art to selectively depolymerize starch into amylopectin and sugars.

Moreover the skilled person can find no incentive to select specific ionic liquid solvents as defined in the claims 9-11 in the process of the depolymerization of polysaccharides such as starch.